CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 85-36

NPDES NO. CA0028398

WASTE DISCHARGE REQUIREMENTS FOR:

U. S. DEPARTMENT OF ENERGY
STANFORD LINEAR ACCELERATOR CENTER,
MENLO PARK, SAN MATEO COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. U. S. Department of Engery, San Francisco operations office, submitted a report of waste discharge (NPDES Short Form C) dated May 17, 1983, for discharge of wastewater from Stanford Linear Accelerator Center (SLAC), located in San Mateo County approximately two miles west of the Stanford Campus.

2. SLAC is a large research laboratory devoted to theoretical and experimental research in high energy physics and to the development of new techniques in high energy accelertor particle detectors. The main tool of the laboratory is a 2 mile long linear accelerator. This accelerator produces beams of electrons with energies up to 22 billion electron volts (22 GeV). It can also accelerate positrons up to 15 GeV. The work is carried out under the sponsorship and financial support of the Department of Energy.

3. The discharge presently discharges cooling tower blowdown water from four separate closed-loop cooling systems, groundwater that has seeped into the accelerator gallery, and some rain runoff into three natural drainage areas, which merge into San Francisquito Creek, a tributary to San Francisco Bay, both waters of the United States. The following wastes containing pollutants are discharged into San Francisquito Creek:

   a. Waste No. 001 consists of an annual average of 5,400 gallons per day of blowdown water from the West Cooling Tower, located adjacent ot the accelerator. The tower provides cooling for accelerator equipment, and the first mile of the accelerator. Wastewater is intermittently discharged via an open drainage ditch to the San Francisquito Creek at a point located approximately 2/3 of a mile east of the west end of the gallery. Flows can reach a maximum of 12,300 gallons per day.

   b. Waste No. 002 consists of an average of 6,300 gallons per day of blowdown water from the East Cooling Tower, located adjacent to the accelerator. The tower provides cooling for accelerator equipment and the second mile of the accelerator. Wastewater is intermittently discharged via an open drainage ditch to the San Francisquito Creek at a point located approximately 1 1/3 mile east of the west end of the gallery. Flows can reach a maximum of 20,700 gallons per day.

c. Waste No. 003 consists of an average of 21,600 gallons per day of a combined discharge of blowdown water from the tower located at the Beam Switchyard and Research Area, providing cooling for research equipment, and a tower located at the Central Utility Building, providing cooling for laboratories and shops of the campus area. The combined effluent is discharged via an open concrete channel and drainage ditch to the San Francisquito Creek at a point where the creek intersects Alpine Road. Flows can reach a maximum of 41,300 gallons per day.

4. This Order serves as a NPDES permit, adoption of which is exempt from the provisions of Chapter 3 (commencing with Section 21110 of Division 13) of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Water Code.

5. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on July 21, 1982. The Basin Plan contains water quality objectives for San Francisquito Creek and San Francisco Bay.

6. The beneficial uses of San Francisquito Creek and San Francisco Bay are:

a. Industrial service supply
b. Water contact recreation
c. Non-contact water recreation
d. Warm fresh water habitat
e. Cold fresh water habitat
f. Wildlife habitat
g. Preservation of rare and endangered species
h. Fish migration and spawning
i. Shellfish harvesting
j. Estuarine habitat
k. Commercial and sport fishing
l. Navigation

7. The discharge is presently governed by Waste Discharge Requirements, Order No. 78-73 as amended by Order No. 82-1, which allow discharge into San Francisquito Creek.

8. The Basin Plan states in part:

a. "... It shall be prohibited to discharge:

1. "Any wastewater which has particular characteristics of concern to beneficial uses at any point at which the waste water does not receive a minimum initial dilution of at least 10:1 or into any nontidal water, dead-end slough, similar confined waters, or any immediate tributaries thereof.

Waste discharges will contain some levels of pollutants regardless of treatment. This prohibition will require that these pollutants, when of concern to beneficial uses, be discharged away from areas of minimal assimilative capacity such as nontidal waters and dead-end sloughs. This prohibition will accomplish the following:

a. Provide an added degree of protection from the continuous effects of waste discharge.

b. Provide a buffer against the effects of abnormal discharges caused by temporary plant upsets or malfunctions.

c. Minimize public contact with undiluted wastes.

d. Reduce the visual (aesthetic) impact of waste discharges.

2. Any wastewater which has particular characteristics of concern to beneficial uses to San Francisco Bay south of the Dumbarton Bridge. This prohibition is consistent with the Bays & Estuaries Policy. This area is one which has experienced chronic water quality problems and has very limited assimilative capacity."

b. "Exceptions to [these] Prohibitions... will be considered for discharges where:

a. an inordinate burden would be placed on the discharger relative to beneficial uses protected and an equivalent level of environmental protection can be achieved by alternative means, such as alternative discharge site, a higher level of treatment, and/or improved treatment reliability; or

b. a discharge is approved as part of a reclamation project; or

c. it can be demonstrated that net environmental benefits will be derived as a result of the discharge."

9. The discharger's waste has particular characteristics of concern to beneficial water uses and is discharged into non-tidal waters, at a point at which the wastewater receives less than 10:1 initial dilution, and subsequently flows into the Bay south of the Dumbarton Bridge.

10. The discharger has requested an exception to both Basin Plan Prohibitions 1 and 2, on the basis that the discharge provides a net environmental benefit.

11. The discharger has submitted a report documenting that the discharger's wastewater provides year round flow, in on otherwise seasonal creek. The year round flow results in habitat suitable for fish spawning, and improves the warm fresh water habitat, wildlife habitat, and riparian habitat.

12. The stream enhancements provided by the discharger's flow satisfy the conditions necessary for the Board to grant an exception to the discharger prohibitions.

13. The Board has notified the discharger and interested agencies and persons of its intent to reissue waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations.

14. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED THAT, the U. S. Department of Energy, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Prohibitions

1. Chemicals used in any of the cooling towers for the purposes of algae control and/or corrosion and deposition inhibition shall not contain zinc, chromium or other heavy metal constituents.

2. The discharge of any radiological, chemical, or biological warfare agent or radiological waste is prohibited.

B. Effluent Limitations

1. Wastes 001, 002, or 003 shall not exceed the following limits:

Constituents	Units	30-day Average	Maximum Daily	Instantaneous Maximum
Oil and Grease	mg/l	5	10	
Total Phosphate(PO_4)	mg/l	12	20	
Settleable Matter	ml/l-hr	0.1	0.2	
Chlorine Residual				0.0

2. The discharge of phosphate (PO_4) shall not exceed the following limits:

Waste	Units	30-day Average	Maximum Daily
001	lbs/day	0.54	0.90
002	lbs/day	0.63	1.05
003	lbs/day	2.16	3.60

3. The discharge of oil and grease resulting from Wastes 001, 002 and 003 combined shall not exceed 1.4 lbs/day (0.63 kg/day) as a 30-day average value and 2.8 lbs/day (1.2 kg/day) as a maximum daily value.

4. The pH of Wastes 001, 002 and 003 shall not exceed 8.5 or be less than 6.5.

5. Wastes 001, 002 and 003 shall meet the following limits of toxicity:

   The survival of test organism acceptable to this Regional Board in 96-hour bioassays of the effluent as discharged shall have a median of 90% survival and a 90 percentile value of not less than 70% survival.

C. Receiving Water Limitations

1. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place.

   a. Floating, suspended, or deposited macroscopic particulate matter or foam;

   b. Bottom deposits or aquatic growths;

   c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

   d. Visible, floating, suspended or deposited oil or other products of petroleum origin;

   e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:

a. Dissolved oxygen	7.0 mg/l minimum. Median for any three consecutive months, not less than 80% of saturation. When natural factors cause lesser concentration(s) than those specified above, then this discharge shall not cause further reduction in the concentration of dissolved oxygen.

3. The discharges shall not cause a violation of any applicable waster quality standard for receiving waters adotped by the Board or the State Water Resources Control Board as required by the Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

D. Provisions

1. The discharger shall comply with all prohibitions and effluent and receiving water limitations of this Order immediately upon adoption.

2. Neither the treatment nor the discharge of wastes shall create a nuisance or pollution as defined in the California Water Code.

3. In order to prevent, or minimize the potential for, the release of toxic substances or other materials deleterious to water quality, from ancillary activities to the waters of the United States through plant runoff, spillage or leaks, sludge or waste disposal or drainage from raw material storage, the discharger shall develop and implement a Best Management Practices (BMP) plan.

   The BMP Plan shall be consistent with the general guidance contained in the publication entitled "NPDES Best Management Practices Guidance Document", dated June 1981, and prepared by the U. S. Environmetal Protection Agency, Office of Water Enforcement and Permits, NPDES Technical Support Branch. At a minimum, the plan shall include the following BMPs:

   a. BMP Committee
   b. Reporting of BMP incidents
   c. Risk identification and assessment
   d. Employee training
   e. Inspections and records
   f. Preventive operation and maintenance
   g. Good housekeeping
   h. Materials compatibility
   i. Security

   The BMP Plan shall be submitted to the Executive Officer, for approval, within six (6) months of the adoption of this permit. The plan shall be implemented within twelve (12) months of the adoption of this permit.

4. The discharger shall review and update annually its contingency plan as required by Board Resolution No. 74-10. The discharge of pollutants in violation of this Order where the discharger has failed to develop and/or implement a current contingency plan will be basis for considering such discharge a willful and negligent violation of this Order pursuant to Section 13387 of the California Water Code.

5. This permit shall be modified or, alternatively, revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(c), and (d), 303(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved;

   (a) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or,

(b) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

6. The discharger shall comply with the self-monitoring program as adopted by the Board and as may be amended by the Executive Officer.

7. The discharger shall comply with all items of the attached "Standard Provisions, Reporting Requirements and Definitions" dated September 1978.

8. The requirements prescribed by this Order supercede the requirements prescribed by the Order No. 78-73 adopted on September 19, 1978, as amended by Order No. 82-1, adopted on January 20, 1982. Orders No. 78-73 and 82-1 are hereby rescinded.

9. All applications, reports, or information submitted to the Regional Board shall be signed and certified pursuant to Environmental Protection Agency regulations [40 CFR 122.41(k)]

10. Pursuant to Environmental Protection Agency regulations [40 CFR 122.42(a)] the Discharger must notify the Regional Board as soon as it knows or has reason to believe (1) that they have begun or expect to begin, use or manufacture of a pollutant not reported in the permit application, or (2) a discharge of a toxic pollutant limited by this permit has occurred, or will occur, in concentrations that exceed the specified limits.

11. This Order expires on April 30, 1990. The discharger must file a report of waste discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements.

12. This Order shall serve as a National Pollutant Discharge Elimination System Permit pursuant of Section 402 of the Clean Water Act or amendments thereto, and shall become effective 10 days after date of its adoption provided the Regional Administrator, Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

I, Roger B. James, Executive Officer do hereby certify the foregoing is a full true and correct copy of an Order adopted by the California Reginal Water Quality Control Board, San Francisco Bay Region on, April 30, 1985.

ROGER B. JAMES
Executive Officer

Attachments:
Standard Provisions for Minor
Discharges, Dated September 1978
Self-Monitoring Program
Resolution 74-10

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM
FOR

Stanford Linear Accelerator Center

U. S. Department of Energy

Menlo Park, San Mateo County

NPDES NO. CA 0028398

ORDER NO. 85-36

CONSISTS OF

PART A

AND

PART B

PART B

I. DESCRIPTION OF SAMPLING STATIONS AND SCHEDULE OF SAMPLING, ANALYSES, AND OBSERVATIONS

Analyses, observations, and examinations shall be performed according to the specifications shown in Table I.

A. EFFLUENT

Station	Description
E-001	At the point at which all waste tributary from the West Cooling Tower is present.
E-002	At the point at which all waste tributary from the East Cooling Tower is present.
E-003	At the point at which all wastes tributary from the cooling towers located at the Central Utility Building and the Beam Switchyard and Research Area are present.

B. RECEIVING WATER

Station	Description
C-R	At a point in San Francisquito Creek 50 feet upstream of the point where any cooling tower water is discharged.
C-1	At a point in San Francisquito Creek 50 feet downstream of the point where all cooling tower discharges are present.

II. MODIFICATION TO PART A

1. Omit the following paragraphs of Part A:

C.3, C.4, C.5.c, C.5.d, C.5.e, D.1, D.3.b, D.4, E.4 and F.2.

I, Roger B. James, Executive Officer, hereby certify the foregoing amended Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Reginal Board Order No. 85-36.

2. Has been ordered by the Regional Board on the date shown below and becomes effective immediately.

3. May be reviewed at any time upon written notice from either the Executive Officer or the discharger, and revisions will be orderd by the Executive Officer.

ROGER B. JAMES
Executive Officer

_____
Date Ordered

Attachment:
Table I

TABLE I
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSES

SAMPLING STATIONS	E-001, E-002 and E-003			C-R & C-1				
TYPE OF SAMPLES	O	C-24	G	G				
Flow rate (gallons/day)		cont						
Settleable Matter (ml/l/hr)			M					
Oil & Grease (mg/l and lbs/day)			W					
pH (units)			W					
Temperature (°F)			W	(2) W				
Toxicity (% survival)			(3) Q					
All Applicable Standard Observations	M			M				
Chlorine Residual & Dosage (mg/l and lbs/day)			(1) E					
Total Phosphate (as PO_4) (mg/l)			2/W	(2) W				
Cooling Water Chemicals (Type and lbs/month added)	M							
Total Suspended Solids (TSS) (mg/l & kg/d)			W	(2) W				
Total Dissolved Solids (TDS) (mg/l & kg/d)			W	(2) W				

LEGEND FOR TABLE

Type of Sample

G = grab sample
C = composite sample - 24-hour
O = observation

Frequency of Sampling

M = once each month
2/W = twice a week
E = each occurrence
W = weekly
Q = quarterly

1. To be sampled after each instance of chlorine application directly from the cooling water and prior to recommencing discharge.

2. To be sampled on days coincident with effluent sampling.

3. To be performed using a salomoid or equally sensitive species.